Technology Maturity and Technology Transition
Relationships and Best Practices

Lance Flitter

Technology Maturity Conference

11 Sept, 2008

Report Documentation Page		Form Approved OMB No. 0704-0188

Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

1. REPORT DATE **11 SEP 2008**	2. REPORT TYPE	3. DATES COVERED **00-00-2008 to 00-00-2008**
4. TITLE AND SUBTITLE **Technology Maturity and Technology Transition Relationships and Best Practices**		5a. CONTRACT NUMBER
		5b. GRANT NUMBER
		5c. PROGRAM ELEMENT NUMBER
6. AUTHOR(S)		5d. PROJECT NUMBER
		5e. TASK NUMBER
		5f. WORK UNIT NUMBER
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) **Naval Surface Warfare Ctr Carderock Div,9500 MacArthur Blvd,West Bethesda,MD,20817-5700**		8. PERFORMING ORGANIZATION REPORT NUMBER
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)		10. SPONSOR/MONITOR'S ACRONYM(S)
		11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION/AVAILABILITY STATEMENT
Approved for public release; distribution unlimited

13. SUPPLEMENTARY NOTES
See also ADM002183. Presented at the Technology Maturity Conference held in Virginia Beach, Virginia on 9-12 September 2008.

14. ABSTRACT

15. SUBJECT TERMS

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT **unclassified**	b. ABSTRACT **unclassified**	c. THIS PAGE **unclassified**	**Same as Report (SAR)**	**16**	

- Defining Technology Transition (high level)

- Identifying and Defining the Source of the Problem

- Defining Technology Transition (working level)

- Transition Challenges

- Approaches / Models

- Best Practices

- Resources

- Team Ships T2WG

Consider the question: how do technology transition and technology maturity relate?

Defining Technology Transition (High Level)

- "Technology transition is the use of technology in military systems to create effective weapons and support systems—in the quantity and quality needed by the warfighter to carry out assigned missions at the "best value" as measured by the warfighter." - Mgr's Guide

- Some functional definitions
  - the active use of a new technology by the warfighter or support personnel
  - the successful incorporation of technology into a product used by the warfighter or support personnel

- At the highest level, from a DoD perspective, technology transition means getting technology to the warfighter and support organizations and personnel.

- Seems pretty straightforward and technology is moved to the warfighter all the time. So what's the problem?

- **The best transition is no transition**
  - One process, organization and funding stream to conceptualize, develop, build, test, acquire, field and support technologies
  - No "transition"; a smooth, continuous process. (At least in theory.)

- **Problem exists due to discontinuities in the processes, organizations and funding involved in developing, integrating, testing, fielding and supporting technology**
  - Multiple organizations for R&D, integration, acquisition, testing and operations & support.
  - Multiple funding streams, requirements and reporting chains.
  - Each community operating in its own "cylinder of excellence" according to its own processes and requirements creates the discontinuity that must then be bridged to effectively move technology to the warfighter.

- **Accounting for the differences described previously, Technology Transition takes on some additional definitions**

- **Programmatic definitions**
  - **the successful transfer of responsibility for development, testing and integration of a technology from the S&T community to the Acquisition community**
  - **the incorporation of a technology (from govt, industry or academia) into the design for or production of an acquisition product**
  - **the successful transfer of responsibility for a technology from the Acquisition community to the Operational community**

- **Definitions based on the primary technology related "cylinders" within DoD: S&T, Acquisition, Operation**
  - **Note: Resources & Requirements (i.e. OPNAV) in some senses is another cylinder but relates to the three above**

Barriers to Technology Transition – Conflicting Paradigms

Technology Development → Transition → Integration → Transition → O&S

S&T Community

Increase The Knowledge Base

Tech Push: You Need What I've Got

High Risk / Risk Embracing

PhD Civilian Scientists

Acquisition Community

Milestone A, B & C

KPPs, KSAs

Cost, Schedule, Performance

Warrant Holders

Risk Averse

Acquisition Professionals

Warfighter Community

Mission Focused

Combat Readiness

Want it now

Surface Warfare Officers

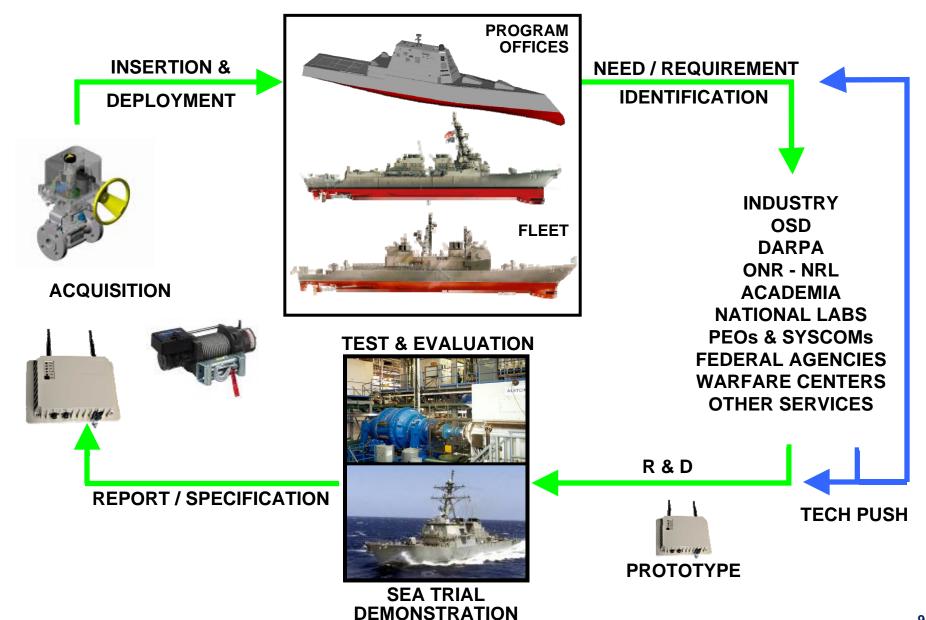## Acquisition in the Transition Sandwich!

- **Identifying the Transition Point / Criteria**

- **Delineating Responsibilities**

- **Funding**

- **Schedule Synchronization**

- **Intellectual Property**

- **Contracting**

- **Interoperability / Integration**

- **Supportability**

- **Affordability**

- ***Understanding the Risk of transitioning a technology***

Technology Transition Management

- **Mission / Purpose: To support utilization of new technology by warfighters and support activities to allow them to better meet operational needs. This is accomplished by maximizing the likelihood of successful technology insertion into acquisition programs and products and to the operational forces through:**

  – the use of systematic processes of analysis, management, documentation and communication of technical and programmatic requirements within and between the Acquisition, Resource, Operational and S&T communities;

  – liaison between technology sources and technology consumers;

  – identification and acquisition of resources to bridge the gap between current technology maturity levels and required levels and oversight of the transition activities.

NSWC, Carderock – Technology Transition Management Knowledge Area

Technology Transition Cycle
(Acquisition Perspective)

INSERTION &
DEPLOYMENT

PROGRAM
OFFICES

NEED / REQUIREMENT
IDENTIFICATION

FLEET

ACQUISITION

INDUSTRY
OSD
DARPA
ONR - NRL
ACADEMIA
NATIONAL LABS
PEOs & SYSCOMs
FEDERAL AGENCIES
WARFARE CENTERS
OTHER SERVICES

TEST & EVALUATION

R & D

REPORT / SPECIFICATION

TECH PUSH

PROTOTYPE

SEA TRIAL
DEMONSTRATION

What GAO Found

- **Leading commercial companies use three key techniques for successfully developing and transitioning technologies, with the basic premise being that technologies must be mature before transitioning to the product line side.**

    - **Strategic planning at the corporate level: Strategic planning precedes technology development so managers can gauge market needs, identify the most desirable technologies, and prioritize resources.**

    - **Gated management reviews: A rigorous process is used to ensure a technology's relevancy and feasibility and enlist product line commitment to use the technologies once the labs are finished maturing them.**

    - **Corroborating tools: To secure commitment, technology transition agreements solidify and document specific cost, schedule, and performance metrics labs need to meet for transition to occur. Relationship managers address transition issues within the labs and product line teams and across both communities. Meaningful metrics gauge project progress and process effectiveness.**

United States Government Accountability Office

GAO

Report to Congressional Committees

September 2006

BEST PRACTICES

Stronger Practices Needed to Improve DOD Technology Transition Processes
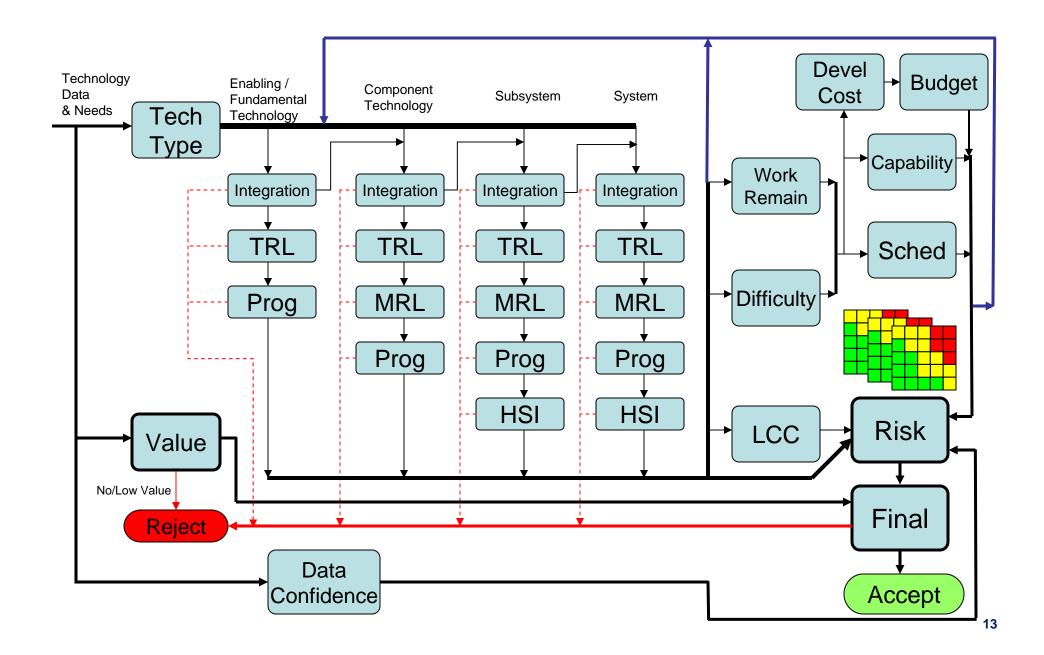
G A O

Accountability * Integrity * Reliability

GAO-06-883

- **GAO recommends that DOD strengthen its technology transition processes by developing a gated process with criteria to support funding decisions; expanding the use of transition agreements, relationship managers, and metrics; and setting aside funding for transition activities.**

- **DOD generally agreed with GAO's recommendations with the exception of adopting process oriented metrics and setting aside funding for [for S&T community for] transition. It cited ongoing initiatives it believes address several of the recommendations.**

- **First step – have/make a plan!**

- **Have a process for technology transition – agreed upon by program management**

  – **Includes <u>metrics</u>; many good metrics out there if you know where to look. Need to identify what's relevant to your program.**

  – **Metrics should tie into and support program decision making processes**

- **Understand capability needs / gaps**

- **Big picture / total life cycle approach**

- **Technology Transition plan should tie into overall program plans**

- **Build plan with transition challenges in mind**

Tools / Approaches

- **Technology Transition Agreements**
  - Good metrics, clear transition criteria and explicit responsibilities are key

- **Transition Managers**
  - Someone whose responsibility it is to work transition issues
  - Biggest mantra about successful transition – it involves <u>strong relationships and communications</u> – "it's a contact sport"

- **IPPD/IPTs**
  - Get the right stakeholders together; early and often

- **Plan for funding of transition in advance as much as possible but, be a master scavenger**
  - Learn to utilize transition programs, leverage other activities and alternate sources of funding
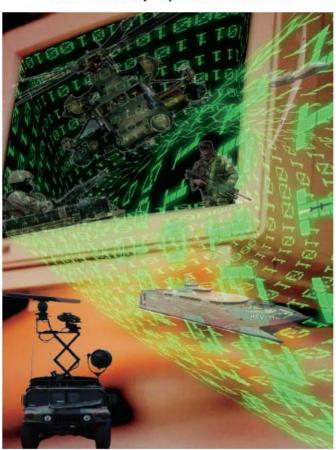
Some Resources

- **DAU publication**

- **Discusses**
  - **DoD environment**
  - **Tech Transition**
    - **Planning**
    - **Tools**
    - **Programs**
    - **Challenges**

- **Also**
  - **GAO report**
  - **TRA Deskbook**
  - **Assorted papers and publications on Technology Transition**
  - **Technology Transition Programs / Venues**

DEPARTMENT OF DEFENSE
DEFENSE ACQUISITION UNIVERSITY

Manager's Guide to Technology Transition
in an Evolutionary Acquisition Environment

DEFENSE ACQUISITION UNIVERSITY PRESS
FORT BELVOIR, VIRGINIA 22060-5565

Summary

- **Successful Technology Transition**
  - Is a process, not an event
  - Is a total life cycle activity
  - Requires active management
  - Depends on strong relationships and communications
  - Is planned for in advance
  - Utilizes agreed upon plans and <u>metrics</u>
  - Requires flexibility
  - Is based on understanding of requirements